Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

LIBRARY
RECEIVED
★APR 27 1931 ★
U. S. Department of Agriculture

1.9
P69Bx
Co
1930

PROGRESS
of the
Barberry Eradication Campaign
in
Colorado and Wyoming in 1930

Black Stem Rust Spread From This Common Barberry Bush To Near-by Grain Fields Causing Severe Damage

Barberry Eradication Pays

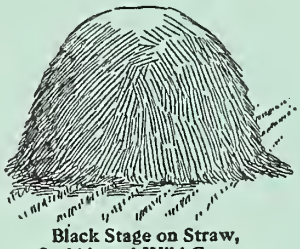
Remove the Barberry and Break the Rust Cycle

Spring

Cluster Cup Stage of Rust on Barberry Leaf

Barberry Bush

Winter



Black Stage on Straw, Stubble and Wild Grasses

Summer

Red Stage of Rust on Growing Grain. Repeats Every Ten Days

The Life Cycle of Black Stem Rust

The World's Most Destructive Disease of Wheat, Oats, Barley and Rye

Harvest Time

Black and Red Stages of Rust on Mature Grain

All Common Barberries act as starting points for Black Stem Rust early each spring. By destroying the barberry the early spring source of black stem rust is eliminated. The Common Barberry provides a means to bridge the gap between the black stage on grain in the fall and the red stage of the rust on grains and grasses the following spring.

BOOST BARBERRY ERADICATION—A PRACTICAL RUST CONTROL MEASURE

PROGRESS OF THE BARBERRY ERADICATION CAMPAIGN IN COLORADO AND WYOMING, 1930

By E. A. Lungren*, Associate Pathologist,
Office of Barberry Eradication, Bureau of Plant Industry,
United States Department of Agriculture.

Introduction

Barberry eradication is a means of reducing the number of local epidemics of black stem rust in Colorado and Wyoming. This plant disease has resulted in heavy losses due to reduction in yield and quality of small grains in the States. Following the severe epidemic of stem rust in 1916, plant pathologists recommended the eradication of the common barberry as a means of reducing stem rust losses and producing a better quality of grain.

More than three-fourths of the grain raised in the United States is grown in thirteen of the upper Mississippi Valley States, namely, Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and Wyoming. These States cooperate with the United States Department of Agriculture in conducting the barberry eradication campaign, and are directly concerned with the control of black stem rust. Common barberry is the alternate host for the fungus causing this disease of wheat, oats, barley, rye and many of our native grasses.

Since 1918 investigations have proved that common barberry is the most important factor contributing to stem rust losses in the Northern part of the United States. The removal of common barberry bushes in the eradication area will delay early rust infection in the States and prevent the recurrence of many destructive epidemics of the disease. Experiments in Colorado and Wyoming show that the red or summer spores which spread this disease can not survive the alternate freezing

---

*Leader of Barberry Eradication. District No. 3.

and thawing of the winter months in these States. The black rust which is commonly found on the old straw or stubble is the winter or resting stage. When these black spores germinate in the spring they can not infect grains without first attacking the common barberry, then spreading from it to the growing crop. However it is possible for the red or repeating stage of stem rust to live throughout the year in the South. Investigations made since 1916 show that the normal spread of stem rust from the South is not a serious factor. As the common barberries are gradually being eliminated in the thirteen Northwest States, losses of small grains from rust have been correspondingly reduced.

The Japanese barberry is harmless and does not spread the rust. Its low spreading habits of growth make it a desirable shrub for landscaping.

Progress of the Campaign

In 1930, the survey in Colorado and Wyoming was of the intensive type. All farm and city properties in the counties where work was done were carefully inspected for common barberry bushes. Rivers and ditch banks, woodlots, fence rows, in fact all places where shrubs commonly grow, were inspected for barberry bushes.

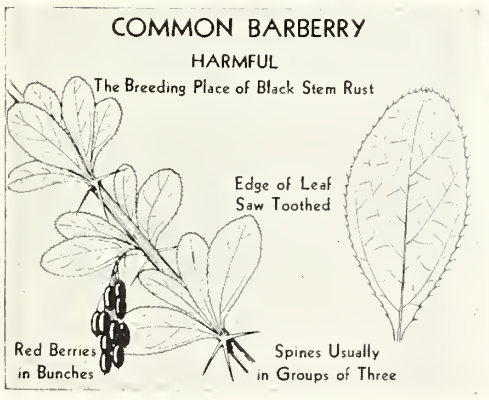
In Colorado a thorough second survey was made of Douglas, Elbert, and El Paso Counties. Three thousand five hundred and three common barberry bushes and seedlings were found and destroyed in these counties this year. One large escaped area of several hundred bushes was found west of Colorado Springs, Colorado. The bushes were growing wild over the hillsides and in the canyons for a distance of ten miles west of the city. They evidently had been spread from barberries that were planted in the city of Colorado Springs prior to 1918.

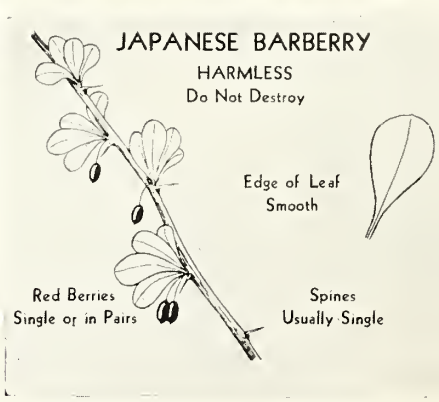
Black Stem Rust

spreads from Common Barberry Bushes to Wheat, Oats, Barley, Rye and many Grasses

Black stem rust of small grains is caused by a tiny parasitic plant. In the Northern States it lives for a time each spring on the leaves of common barberry bushes. The dust-like spores of the rust are spread by the wind for miles from barberry bushes to grain fields and from one grain field to another. Warm, moist weather aids the rapid development and spread of stem rust, just as the growth of corn, wheat, or other crops is affected by favorable weather conditions. Destroy common barberry bushes and reduce losses from stem rust.

Learn to Know Common Barberry





Report common barberry bushes you may find, to the Barberry Eradication Office in your State, your Agricultural College, your State Department of Agriculture, or the Barberry Eradication Office, United States Department of Agriculture, Washington, D.C.

To December 31, 1930 -- 46,195 barberry bushes and seedlings have been found and eradicated from 38 counties in Colorado. The following figures show the results of the survey work for 1930, also for the entire campaign.

Number of Barberry Bushes and Seedlings
Found and Destroyed in Colorado During 1930
Field Season

Counties	Barberry Bushes		Seedlings	
	Found	Destroyed	Found	Destroyed
Douglas	6	6	25	25
El Paso	863	863	2609	2609
Total	869	869	2634	2634

Grand total bushes and seedlings found 3503

" " " " " destroyed 3503

Number of Barberry Bushes and Seedlings Found and Destroyed in Colorado During the Entire Campaign

From 1918 to 1930 Inclusive

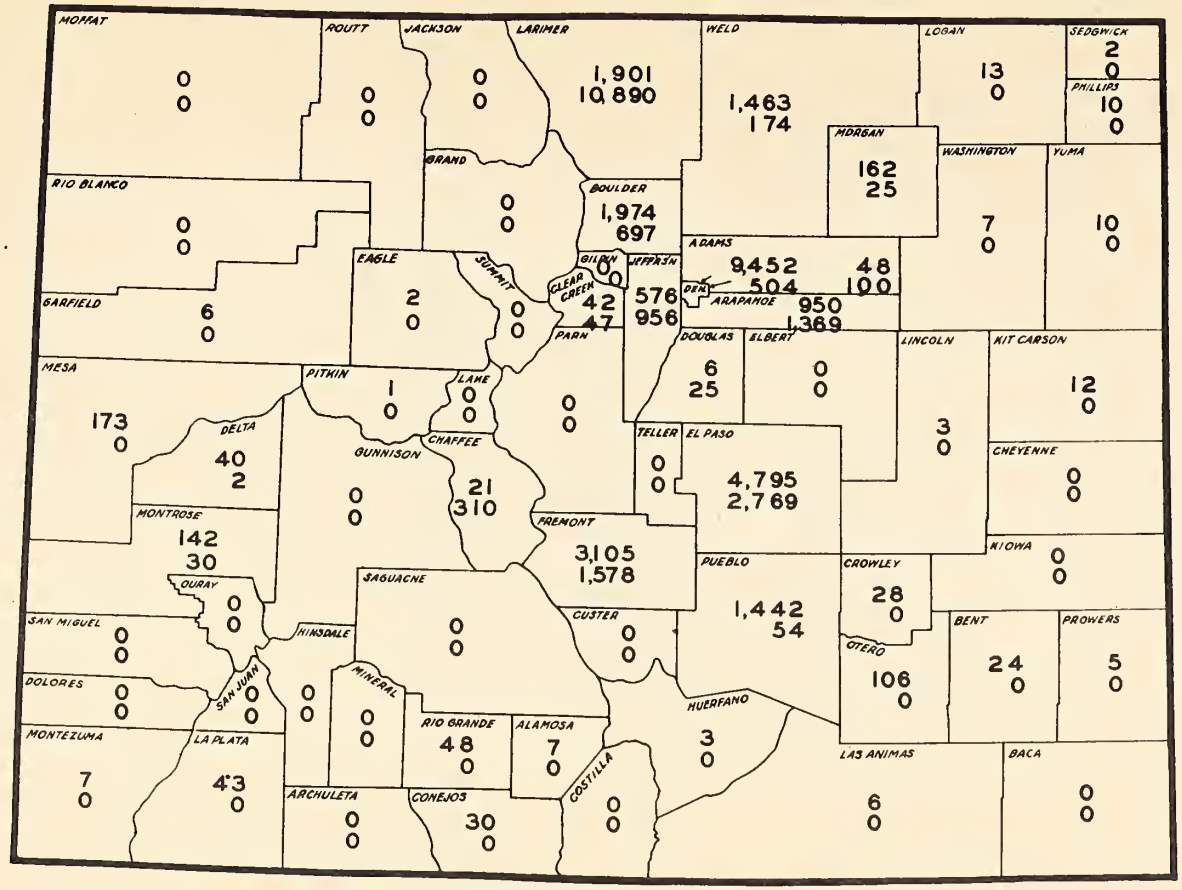
Counties	Barberry Bushes		Seedlings	
	Found	Destroyed	Found	Destroyed
Adams	46	48	100	100
Alamosa	7	7	0	0
Arapahoe	950	950	1339	1339
Bent	24	24	0	0
Boulder	1974	1974	697	697
Chaffee	21	21	310	310
Clear Creek	42	42	47	47
Conejos	30	30	0	0
Crowley	28	28	0	0
Delta	40	40	2	2
Douglas	6	6	25	25
Eagle	2	2	0	0
Denver	9453	9452	504	504
El Paso	4795	4795	2769	2769
Fremont	3105	3105	1578	1578
Garfield	6	6	0	0
Huerfano	3	3	0	0
Jefferson	576	576	956	956
Kit Carson	12	12	0	0
La Plata	43	43	0	0
Larimer	1901	1901	10890	10890
Las Animas	6	6	0	0
Lincoln	3	3	0	0
Logan	13	13	0	0
Mesa	173	173	0	0
Montezuma	7	7	0	0
Montrose	142	142	30	30
Morgan	162	162	25	25
Otero	106	106	0	0
Phillips	10	10	0	0
Pitkin	1	1	0	0
Prowers	5	5	0	0
Pueblo	1442	1442	54	54
Rio Grande	48	48	0	0
Sedgwick	2	2	0	0
Washington	7	7	0	0
Weld	1463	1463	174	174
Yuma	10	10	0	0
Total	26636	26665	19530	19530

Grand total bushes and seedlings found 46,166

" " " " "destroyed 46,195

NUMBERS OF BARBERRY BUSHES AND SEEDLINGS DESTROYED, 1918-1930

COLORADO



UPPER FIGURE = BUSHES DESTROYED..... 26,665
LOWER FIGURE = SEEDLINGS DESTROYED..... 19,530
SPROUTING BUSHES (NOT SHOWN)..... 7,022
GRAND TOTAL..... 53,217

BE-1432

In Wyoming a survey was conducted in Goshen, Crook, Platte, and part of Converse Counties this season. Two hundred and fifteen barberry bushes and seedlings were found in these counties. Bushes on two of the properties in Platte County and on one property in Crook County were spreading rust to near-by grain fields. The heaviest rust infection found in Wyoming this season was in the vicinity of these infected barberry bushes.

To December 31, 1930, 4456 common barberry bushes and seedlings have been found and eradicated from twenty-three counties in Wyoming. Application of salt to the crown of the bush is a very effective killing agent and has aided greatly in barberry eradication in this State. The following tables give the results by counties for this season and the entire campaign.

Number of Barberry Bushes and Seedlings
Found and Destroyed in Wyoming
During 1930 Field Season

Counties	Barberry Bushes		Seedlings	
	Found	Destroyed	Found	Destroyed
Converse	0	0	0	0
Crook	14	14	40	40
Goshen	1	1	0	0
Platte	4	4	156	156
Total	19	19	196	196

Grand total bushes and seedlings found 215

" " " " " destroyed 215

Number of Barberry Bushes and Seedlings
Found and Destroyed in Wyoming During the
Entire Campaign

From 1918 to 1930 Inclusive

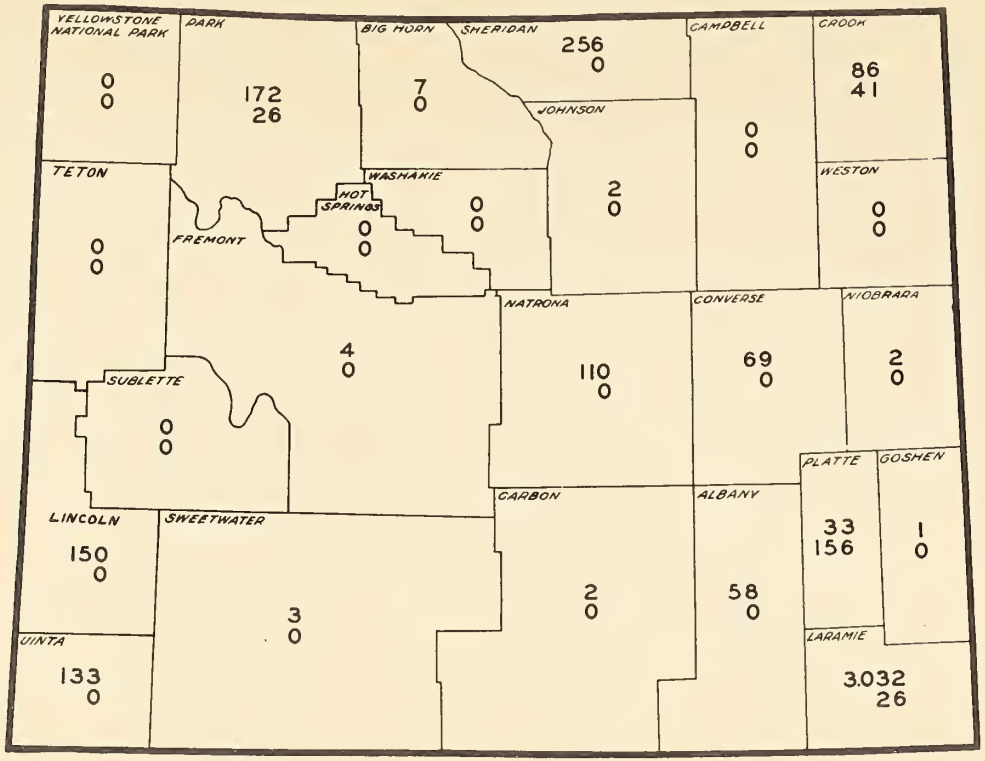
County	Barberry Bushes		Seedlings	
	Found	Destroyed	Found	Destroyed
Albany	58	58	0	0
Big Horn	7	7	0	0
Campbell	0	0	0	0
Carbon	2	2	0	0
Converse	69	69	0	0
Crook	86	86	41	41
Fremont	4	4	0	0
Goshen	1	1	0	0
Hot Springs	0	0	0	0
Johnson	2	2	0	0
Laramie	3119	3119	26	26
Lincoln	150	150	0	0
Natrona	110	110	0	0
Niobrara	2	2	0	0
Park	172	172	26	26
Platte	33	33	156	156
Sheridan	256	256	0	0
Sublette	0	0	0	0
Sweetwater	3	3	0	0
Teton	0	0	0	0
Uinta	133	133	0	0
Washakie	0	0	0	0
Weston	0	0	0	0
Total	4207	4207	249	249

Grand total bushes and seedlings found 4456

" " " " " destroyed 4456

NUMBERS OF BARBERRY BUSHES AND SEEDLINGS DESTROYED, 1918-1930

WYOMING



UPPER FIGURE = BUSHES DESTROYED..... 4,120
LOWER FIGURE = SEEDLINGS DESTROYED..... 249
SPROUTING BUSHES (NOT SHOWN)..... 574
GRAND TOTAL..... 4,943

BE-1444

Common Barberries Spread by Seed

Common barberry bushes should be eradicated in cities and towns, as well as in the country. Thousands of small red berries are produced on an average-sized barberry bush, and in each berry there are two seeds. The birds feed on the berries and carry the seed to out-of-way places. It can readily be seen how one fruiting barberry may be responsible for several thousand escaped bushes. Large areas of escaped bushes have been found in some of the Western States, and in order to clean up such locations it is necessary to make a very careful and thorough inspection of all places where seeds may have been scattered by birds or other animals.

The successful completion of the barberry eradication campaign depends (1) upon the destruction of all fruiting bushes, whether planted or escaped, and (2) upon the eradication of such bushes and seedlings as may develop from seed previously scattered by the many different agencies.

Education and Publicity

In addition to the survey and eradication program, educational activities are important for at least two reasons. First, field agents of the United States Department of Agriculture are often assisted in locating barberry bushes by property owners and students who have learned to identify the common barberry as well as recognize rust when it first appears in the early spring or summer. Second, barberry seeds scattered by the birds produce bushes in secluded places which may be overlooked by the field agents. Such bushes are often located by property owners or students.

Materials for class room use have been mailed to practically every school in Colorado and Wyoming. Lesson plans for teachers have been provided for use in grade schools, high schools, Smith-Hughes schools, and colleges.

In order to stimulate interest among the grade school children, rust buster clubs have been organized. Each student is presented with a button which designates him or her as a member. An organized inspection of communities has been made by rust buster clubs. Medals are awarded to members finding common barberry bushes.

Through the news service, timely articles on barberry eradication were sent to many papers throughout Colorado and to papers in the counties in Wyoming where work was being conducted. Stories on the progress of the work were given to papers at intervals throughout the season.

Two radio talks on barberry eradication were given over KOA in Denver. Special lectures were given to schools, college classes, and business clubs. Demonstrations were held at the fair in the county where work was conducted. In addition demonstrations were placed at the Colorado and Wyoming State Fairs and at the Colorado State Seed Show.

It is important that every person, whether or not directly interested in small-grain production, should realize the necessity of destroying all common barberry bushes to prevent further spread of the bush, and to insure the continued reduction of losses from black stem rust.

List of educational materials sent to schools

in Colorado and Wyoming

Bulletins and Circulars

- Farmers' Bulletin 1544
- Department Circular 356
- Miscellaneous Publication No. 7
- Colorado State Bulletin

Laboratory Outline

Lesson Plans

Conference Calendars

Literature File Boxes

Rust Busters Material

- Buttons
- Posters

Specimen Envelopes

Rusted Straw Samples

Microscope Slides

Maps

Colored Plates I and II

Copies of one or more of the publications listed above will be mailed free of charge to individuals interested in a further study of stem rust control methods.

Rust in Colorado and Wyoming 1930

Very little damage occurred from black stem rust in Colorado and Wyoming in 1930. The winter wheat in eastern Colorado and Wyoming was practically free from stem rust. A trace of rust appeared late in the season on the spring wheat in Colorado, but the resulting damage was slight.

The heaviest rust infection found in Wyoming was in the vicinity of infected barberries in Crook and Platte Counties.

Weather conditions were ideal in many sections of the State for rust development. The wheat yields in the dry land sections of southern Wyoming and eastern Colorado were above the average, due to timely rains during the spring and early summer. Investigations have shown that the destruction of many barberry bushes in this area has had a tendency to delay the spring infection of stem rust.

All Known Methods of Rust Control Must be Employed

While barberry eradication is of first importance, there are several known methods for reducing losses due to black stem rust. Certain varieties of wheat, oats, and barley that are more disease-resistant than others have been produced by plant breeders. Wherever these varieties meet the requirements of a given region and are desirable from the standpoints of yield, milling quality, and resistance to other cereal diseases, they should be substituted for the less satisfactory varieties. Early sowing of grain, proper preparation of the seed bed, avoidance of low, poorly drained land, proper use of fertilizers, in fact, anything that promotes early ripening of the grain, will help to reduce the danger from rust.

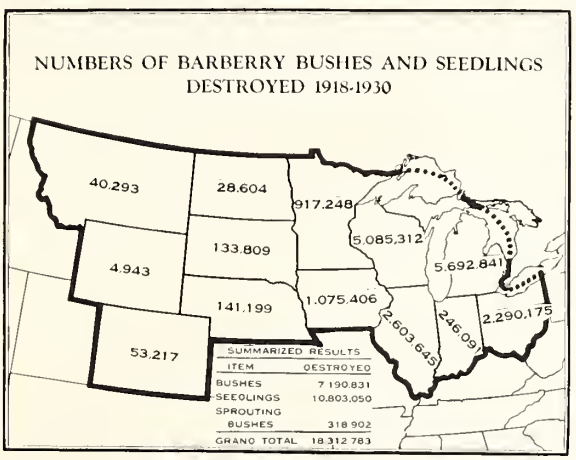
COMMON SALT KILLS BARBERRY BUSHES AND PREVENTS SPROUTING

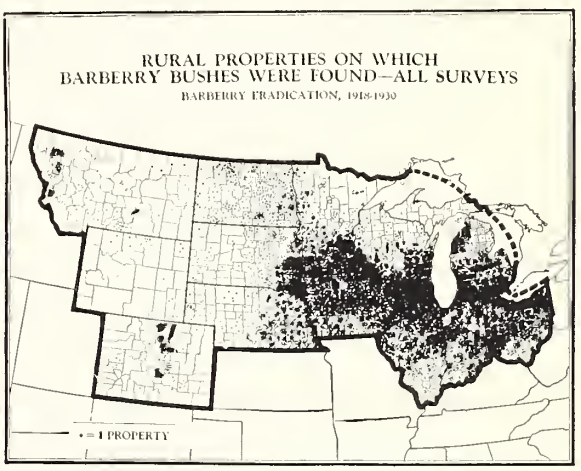
SALTING A BUSH

SPROUTS FROM DUG BUSH

Birds, animals and man chiefly are responsible for the wide distribution of the seeds of common barberries. Every fence row, thicket, pasture or wood is a possible hiding place for these bushes.

Every man, woman and child should consider it his or her duty to look for and report common barberry bushes.

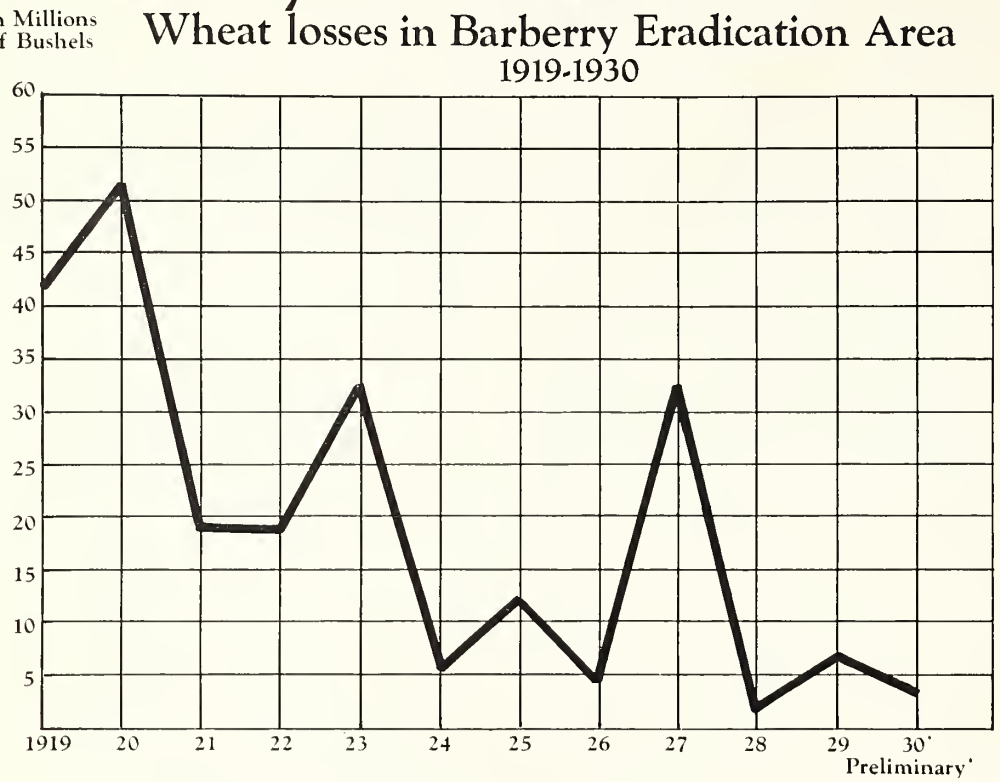




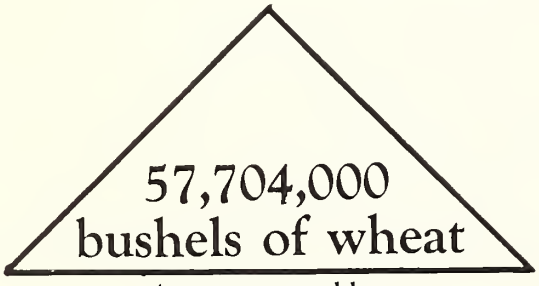
More than 18 million sources of black stem rust were removed 1918-30

Prepared by the Rust Prevention Association, 300 Lewis Building, Minneapolis, Minn., in co-operation with Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D.C.

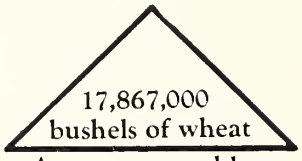
Barberry Eradication Pays



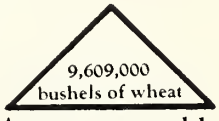
The losses to small grain crops caused by black stem rust have been reduced since the beginning of the barberry eradication campaign in 1918. The breeding of rust-resistant varieties, the use of early maturing varieties, and the sowing of crops early, have aided in this reduction.



Average annual loss
five-year period
1916-1920



Average annual loss
five-year period
1921-1925



Average annual loss
five-year period
1926-1930

Millions of bushels of oats, barley and rye also are damaged each year by black stem rust

Rust shriveled grain always is discounted

Destroy all Common Barberries—Reduce Losses from Stem Rust.
Receive the Highest Available Price for Grain.

New Strains of Destructive Black Stem Rust Develop on the Common Barberry

The production of rust-resistant varieties of grains probably will be much more successful when all common barberry bushes have been eradicated. The reason for this is shown in the recent important discoveries made in the Canadian Rust Research Laboratories at Winnipeg and by E. C. Stakman and his coworkers at the University of Minnesota. Both of these groups conducting independent research have proved that entirely new strains of black stem rust are produced if two different forms of the rust crossbreed on the barberry leaves. The certainty that new forms of the dangerous disease may appear suddenly makes the eradication of the common barberry all the more imperative, since it is on the barberry alone that this crossing can occur in nature. The new and apparently resistant varieties of grains are not safe with barberries near. If for no other reason than to protect the new kinds of superwheat which are now in the process of being developed, all common barberry bushes should be destroyed.

Future Plans for Barberry Eradication in Colorado and Wyoming.

Investigations have shown that barberry seeds may lie dormant for six to eight years before germinating. For this reason survey plans must include some provisions for reinspection of the escaped areas at intervals of two to four years, until all the seedlings and small bushes have been destroyed.

The type of survey conducted during the early part of the campaign, at which time every county was hurriedly inspected, resulted in the eradication of many barberry bushes. By conducting a second, more intensive inspection, an attempt is being made to clean up the remaining bushes and seedlings. In local-

ities where many bushes have escaped cultivation, further inspections undoubtedly will be necessary.

Next season it is planned to conduct a second survey in Douglas and Elbert Counties in Colorado, followed by a second survey of Fremont and Pueblo Counties. In Wyoming second survey will be conducted in Campbell, Weston and Niobrara Counties.

Conclusions

Barberry eradication is a protective measure necessary for the safeguarding of present and future grain crops against the ravages of black stem rust.

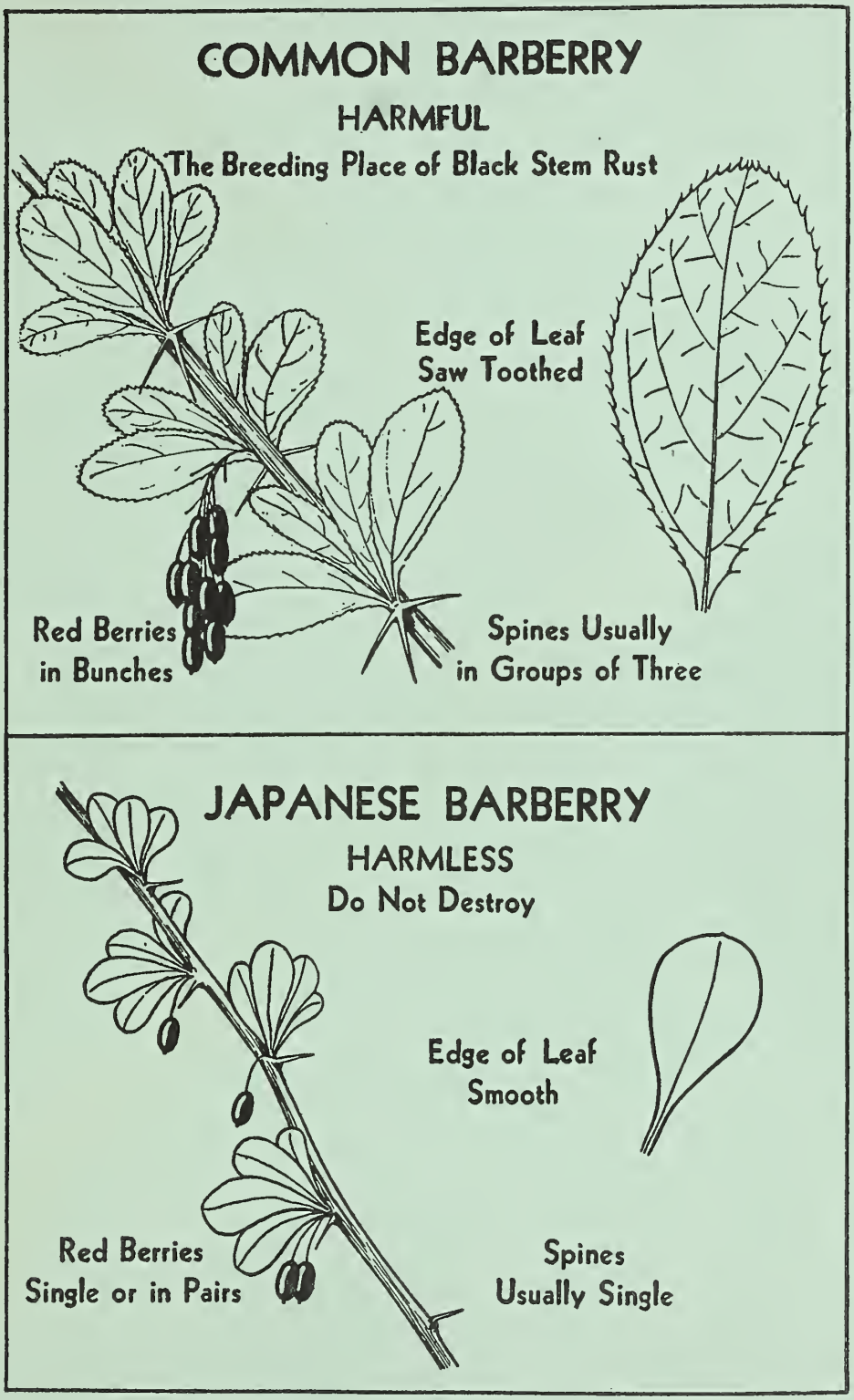
The success of the barberry eradication campaign in Colorado and Wyoming depends upon the careful and persistent field work, the definite educational program, and the cooperation of the people in these States.

Everyone should learn to recognize the common barberry. It is an erect growing shrub, usually five to ten feet high. The bark is grey and the wood of the stems and roots is decidedly bright yellow. Spines occur along the stems in groups of three or more. The leaves are produced in clusters having bristle-like edges, and they may be green or reddish-purple in color. The flowers are yellow and produce red berries in clusters like currants.

The Japanese barberry does not spread rust. It is used for landscaping and its planting is encouraged. It is recognized by its low spreading habit of growth and is seldom more than four or five feet high. The bark is reddish and the spines along the stems are usually single. The leaves are smooth-edged and may be either red or green. The berries are red, occurring in the same manner as gooseberries.

Every person in Colorado and Wyoming can cooperate by reporting the location of common barberries, and early rust outbreaks to the District Office of Barberry Eradication at Fort Collins, Colorado.

Common Barberry Spreads Black Stem Rust



Look For and Report All Common Barberry Bushes

To the State Leader of Barberry Eradication, in care of your State Department of Agriculture or your State Agricultural College.

Common Barberry Bushes

spread

Black Stem Rust

to

WHEAT, OATS,
BARLEY, RYE,
and Many Wild
Grasses

THIS Progress Report is prepared and printed by the Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C. The cover is furnished by the Conference for the Prevention of Grain Rust, 300 Lewis Building, Minneapolis, Minnesota.